Sprinkler System Solutions

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Content

- What is n Extended Coverage Sprinkler
- How does it differ from a standard coverage
- Comparing systems (SC & EC)

Extended Coverage vs Standard Coverage Sprinkler Heads

Extended Coverage Sprinklers

- For specific light and ordinary hazards occupancies
  - refer to NFPA 13 (2013)- Chapter 5
- Intended for protection of large spaces
- Typically used in function rooms, halls, foyer, restaurants, guests rooms, and offices.







Key Objectives of EC Sprinklers

- Each Sprinkler is able to protect a larger coverage area compared to a Standard Coverage Sprinkler
- Reduces the overall number of required sprinklers
- Lower installation cost
- More efficient system as compared to standard coverage sprinklers
- Lower operating pressure in accordance with the S x L Spacing Rules defined by NFPA 13, Section 8.5.2 (Based on similar K- Factor) or CP-52.

New Technology

NFPA 13 states:

"…Nothing in this standard is intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered…"

© NFPA

Can Extended Coverage – CP-52

// Can Extended Coverage and Light hazard Classification be used in Singapore ?

- Yes… *But the code states, …*

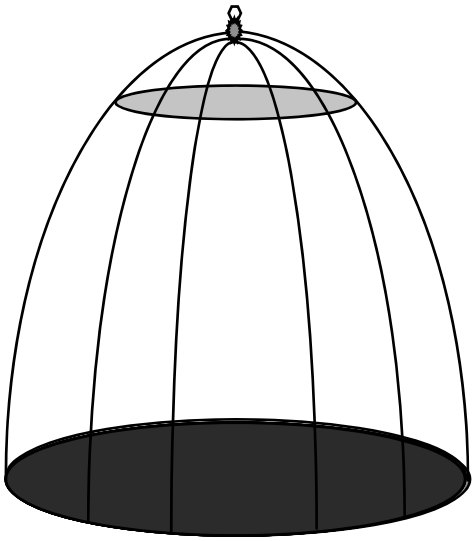
  Limited to the area of six sprinklers

  or 126 square meters… (Paraphrased)

Extended Coverage Sprinklers

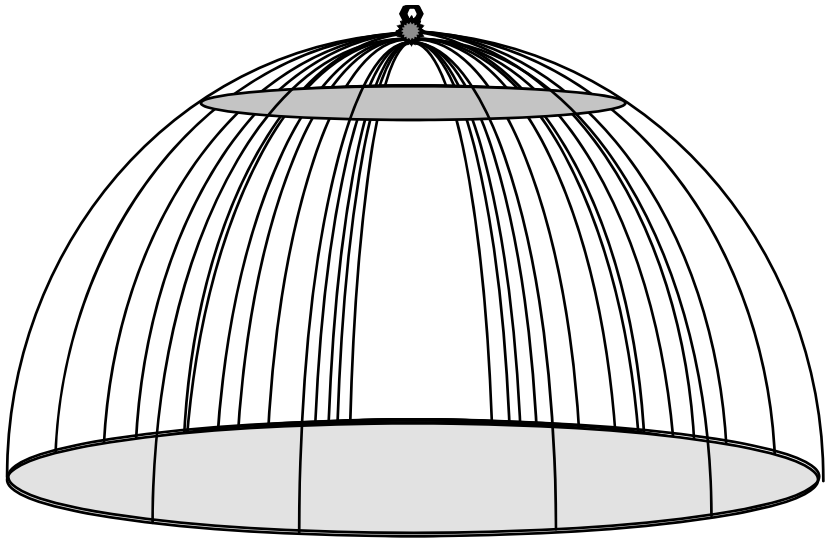
Comparison with Standard Coverage

Standard Coverage vs. Extended Coverage



Standard Spray

Increases in Density



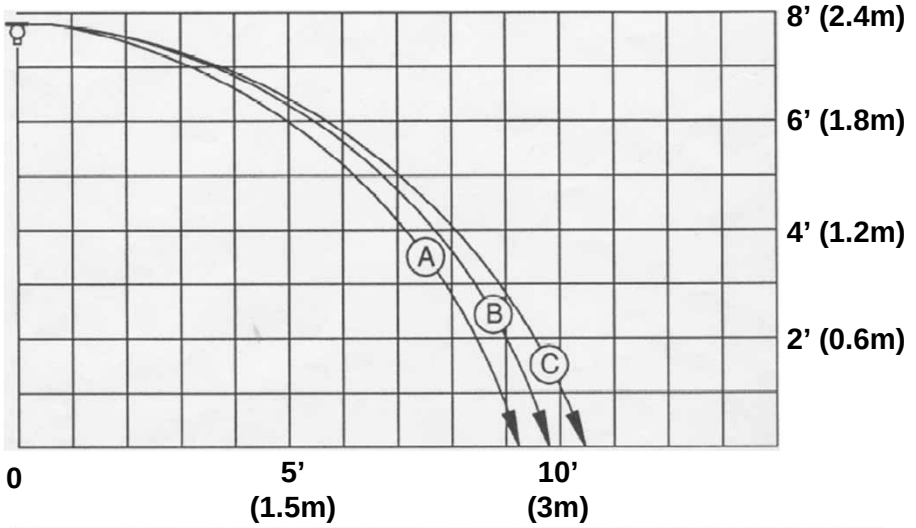
Extended Coverage

Increases in Coverage

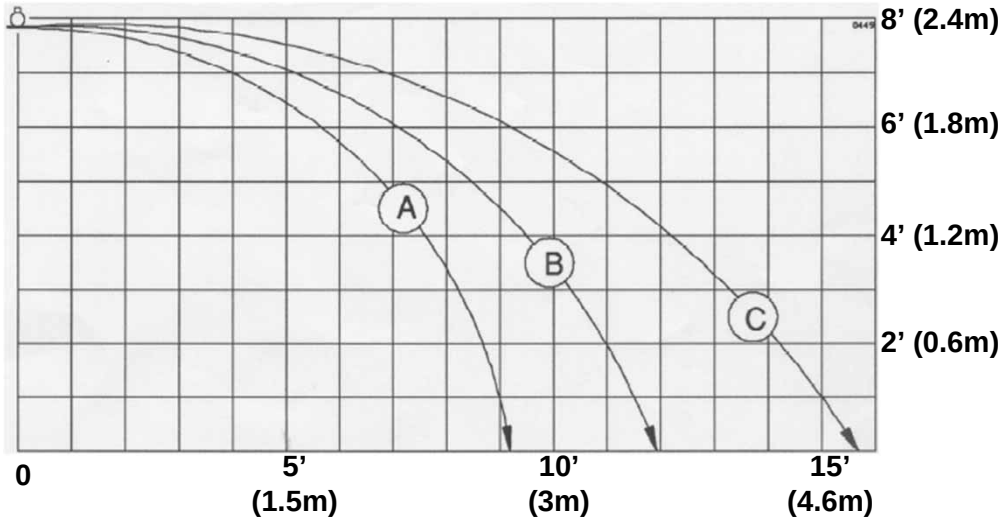
Spray Profile

Standard Coverage Spray Profile

	Flow gpm (lpm)	Pressure psi (bar)
A	14.6 (55.3)	7 (0.48)
B	21.3 (80.6)	15 (1.03)
C	30.1 (113.9)	30 (2.07)



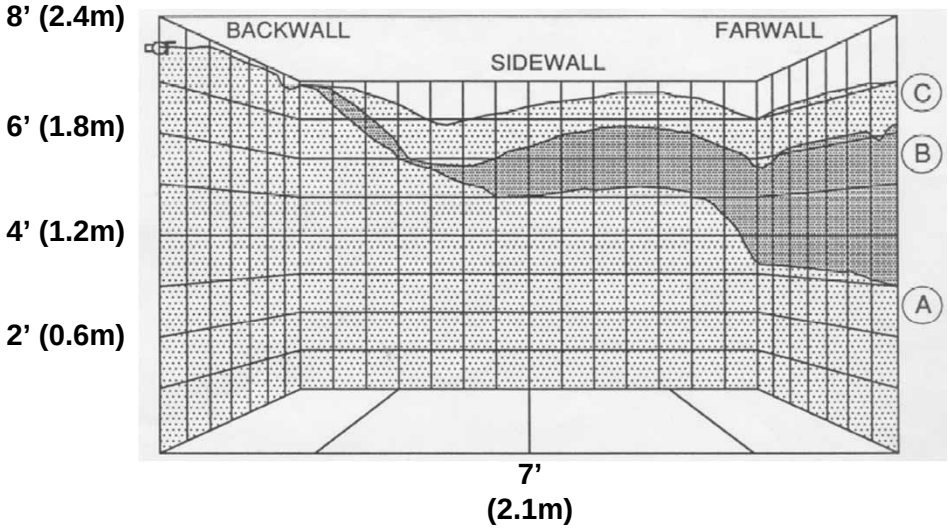
Extended Coverage Spray Profile



Spray Profile

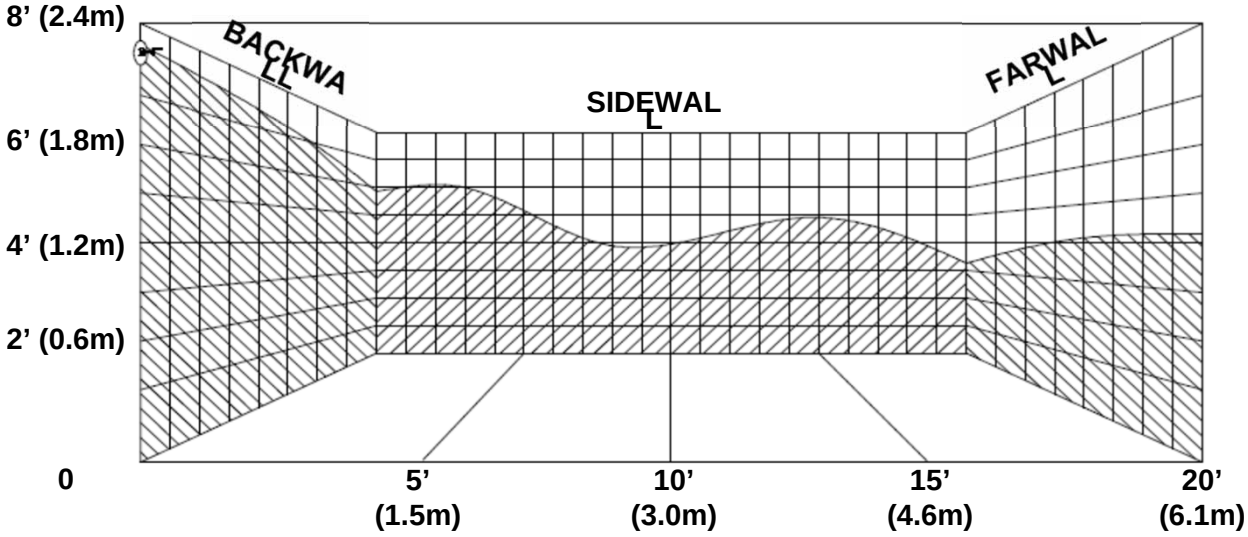
Standard Coverage Spray Profile

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B	21.3 (80.6)	15 (1.03)
C	30.1 (113.9)	30 (2.07)



Extended Coverage Spray Profile

Flow gpm (lpm)	Pressure psi (bar)
40 (151.4)	25 (1.73)

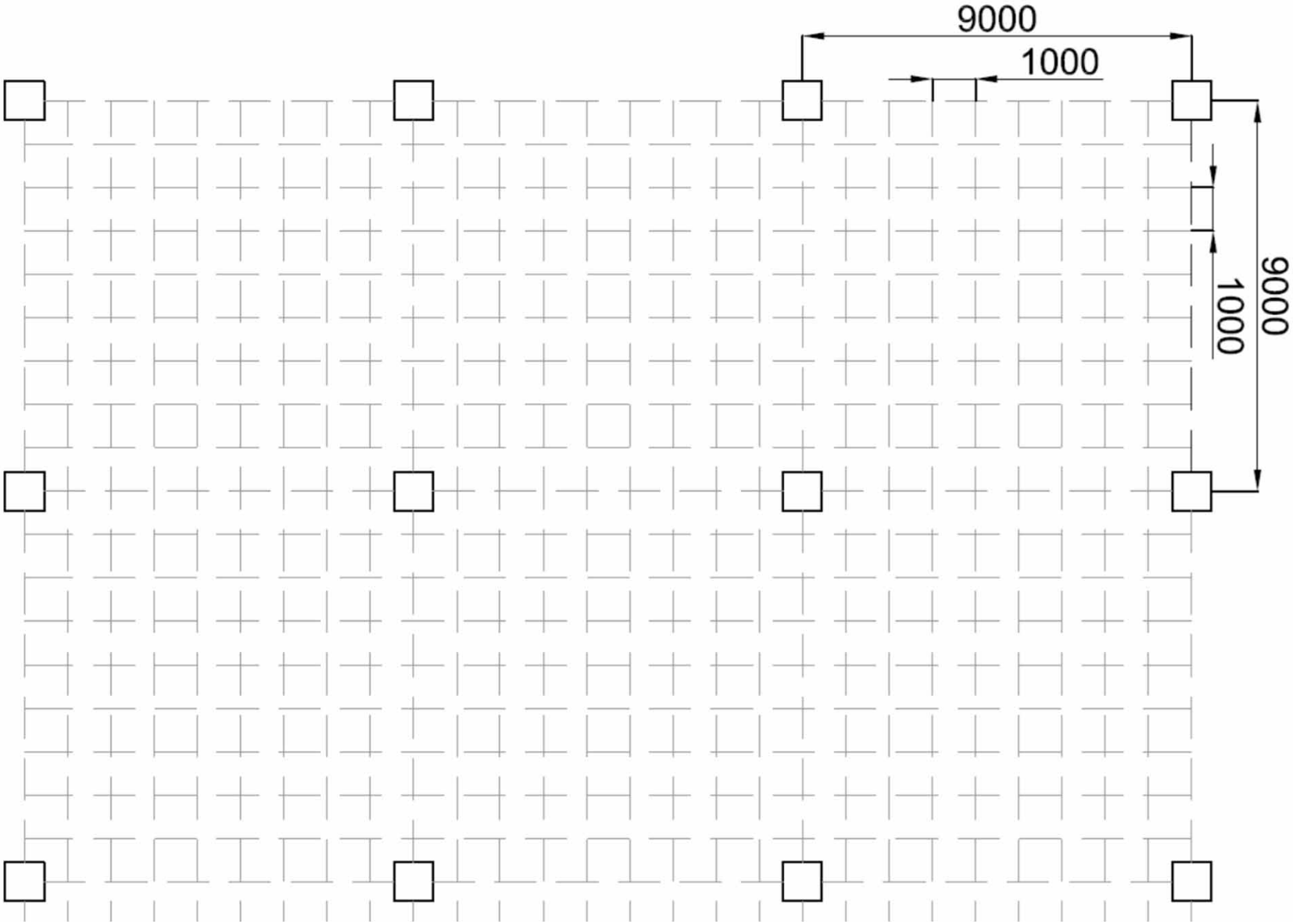


TYCO Standard Coverage Sprinklers

General Spacing for an Upright or Pendent

Typical Spacing 3 meters by 4 meters, based on Classification. (OH-1 or 2)

Exercise



TYCO Extended Coverage Sprinklers

EC-5

Pendent & Recessed Pendent

- Light hazard
- 3 mm bulb
- Coverage up to 20' x 20' (6,1 m x 6,1 m)

K FACTOR	K=5.6 (80,6)
THREAD SIZE	½" NPT
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	135°F/57°C, 155°F/68°C
ESCUTCHEON	Style 50
ESCUTCHEON FINISH	Signal White, Chrome Plated, Brass Plated
SPRINKLER FINISH	Natural Brass, Chrome Plated, Signal White Polyester
SIN	TY3232
TECH DATA	TFP228



Sprinkler Wrenches



Horizontal Sidewall & Recessed Horizontal Sidewall

- Light hazard
- 3 mm bulb
- Coverage up to 16' x 24' (4,9 m x 7,3 m)
- Designed for use in hydraulically calculated sprinkler systems in commercial occupancies such as churches, restaurant seating areas, hotels, educational facilities, offices, etc.

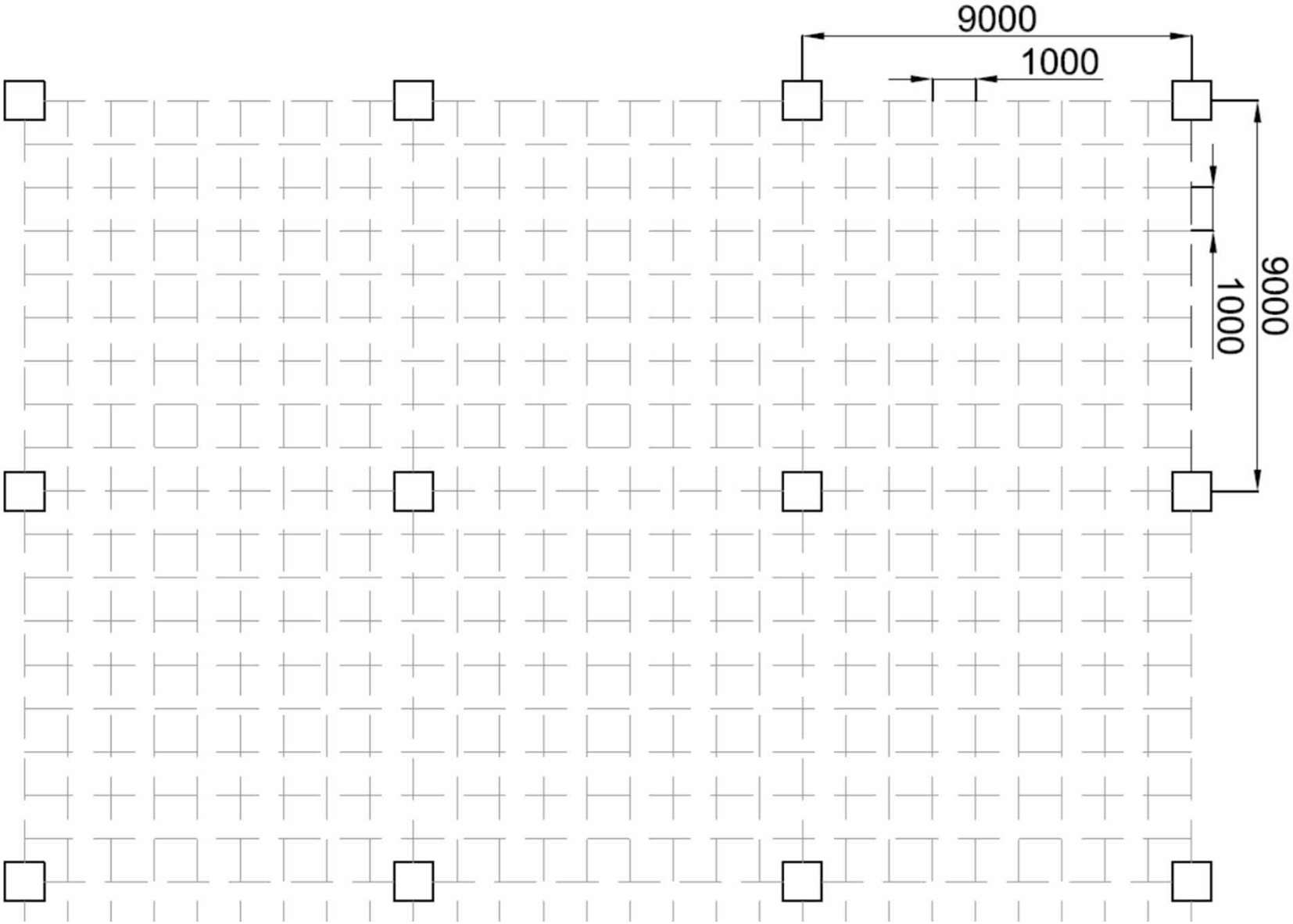
K FACTOR	K=5.6 (80,6)
THREAD SIZE	½" NPT
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	135°F/57°C, 155°F/68°C, 200°F/93°C
ESCUTCHEON	Style 50
ESCUTCHEON FINISH	Signal White, Chrome Plated, Brass Plated
SPRINKLER FINISH	Signal White, Pure White Natural Brass, Chrome Plated
SIN	TY3302
TECH DATA	TFP298



Sprinkler Wrenches



Exercise



TYCO Extended Coverage Sprinklers

EC-8

Pendent & Recessed Pendent

- Light hazard
- 3 mm bulb
- Covers areas as large as 20' x 20' (6,1 m x 6,1 m)
- The Series EC-8 Extended Coverage Pendent Sprinklers are decorative glass bulb sprinklers designed for use in light hazard occupancies.

K FACTOR	K=8.0 (115,2)
THREAD SIZE	¾" NPT
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	135°F/57°C, 155°F/68°C
ESCUTCHEON	Style 30 • Style 40
ESCUTCHEON FINISH	Natural Brass, Signal White, Chrome Plated
SPRINKLER FINISH	Natural Brass, Signal White Polyester, Chrome Plated
SIN	TY4232
TECH DATA	TFP223



Sprinkler Wrenches



TY-FRB

Horizontal & Recessed Horizontal Sidewall

- Light hazard
- 3 mm bulb
- Two-piece escutcheon converts sidewall sprinklers into low profile sprinkler assemblies with coverage areas up to 16' x 22' (4,9 m x 6,7 m) for K=5.6 and 16' x 24' (4,9 m x 7,3 m) for K=8.0
- Provides ¾" NPT (19,1 mm) of horizontal adjustment from the recessed sidewall position
- Quick & Standard Response (see tech data sheet)

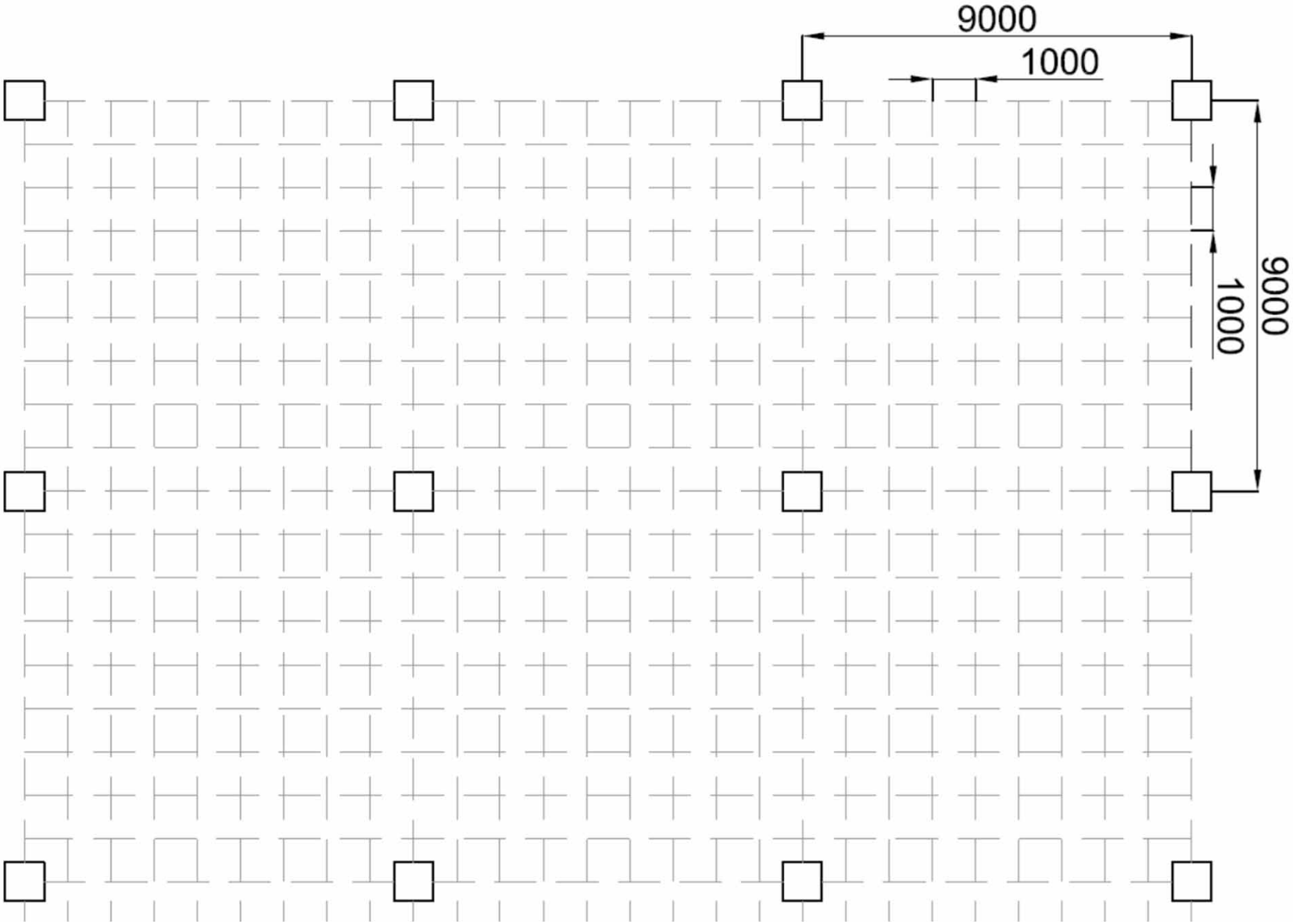
K FACTOR	K=5.6 (80,6) K=8.0 (115,2)
THREAD SIZE	½" NPT • ¾" NPT
APPROVALS	5.6= UL, C-UL, FM, NYC, VdS • 8.0= UL, C-UL, FM, NYC
TEMPERATURE	135°F/57°C, 155°F/68°C, 175°F/79°C
ESCUTCHEON	Style 10 • Style 20 Style 30 • Style 40
ESCUTCHEON FINISH	White Coated, Chrome Plated, Brass Plated
SPRINKLER FINISH	Natural Brass, White Polyester, Chrome Plated
SIN	TY3332, TY4332
TECH DATA	TFP296



Sprinkler Wrenches



Exercise



TYCO Extended Coverage Sprinklers

ELO SW-20/SW-24

Horizontal Sidewall

- 3 mm bulb
- Standard Response, Extended Coverage Ordinary Hazard (ECOH) Horizontal Sidewall Sprinklers are decorative glass bulb sprinklers designed for use in ordinary hazard occupancies per NFPA 13
- SW-20 Listed to a 16'-0" (4,9 m) wide and a 20'-0" (6,1 m) throw maximum coverage area
- SW-24 Listed to a 16'-0" (4,9 m) wide and a 24'-0" (7,3 m) throw maximum coverage area

K FACTOR	K=11.2 (161,3)
THREAD SIZE	¾" NPT
APPROVALS	UL, C-UL, NYC
TEMPERATURE	155°F/68°C, 200°F/93°C
SPRINKLER FINISH	Natural Brass, Chrome Plated, Signal White Polyester
SIN	TY5332, TY5337
TECH DATA	TFP230



Sprinkler Wrench



TY-FRL

Horizontal Sidewall

- Light hazard
- Solder type
- Designed for use in commercial occupancies such as churches, restaurant seating areas, hotels, educational facilities, offices, etc.
- Coverage up to 16 feet (4,9 m) wide by 24 feet (7,3 m) long, they are designed for installation along a wall or the side of a beam and just beneath a smooth, flat, horizontal ceiling

K FACTOR	K=5.6 (80,6) • K=8.0 (115,2)
THREAD SIZE	½" NPT • ¾" NPT
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	165°F/74°C
SPRINKLER FINISH	Natural Brass, Chrome Plated
SIN	TY3322, TY4322
TECH DATA	TFP280



Sprinkler Wrench



TYCO Extended Coverage Sprinklers

CHEC

Concealed Horizontal Extended Coverage Sidewall

- Light hazard
- 3 mm bulb
- Coverage up to 16' x 16' (4,9 m x 4,9 m)
- Lowest flows & pressures allowed by NFPA 13
- ½" adjustment
- 12" maximum deflector distance from ceiling
- No "Slots" in cover plate
- It is the best choice for architecturally sensitive areas such as dormitories, hotel rooms, reception areas, office buildings, banquet facilities, conference rooms, and hospitals

K FACTOR	K=8.0 (115,2)
THREAD SIZE	¾" NPT
APPROVALS	UL, C-UL, NYC
TEMPERATURE	155°F/68°C - Sprinkler 139°F/59°C - Cover Plate,
COVER PLATE FINISH	Signal White, Pure White, Chrome Plated, Custom
SIN	TY4332
TECH DATA	TFP265



Sprinkler Wrench

ELOC

Concealed Pendent

- Light hazard
- Extra Large Orifice Concealed (ELOC) Pendent Sprinklers are decorative, fast response solder type sprinklers featuring a flat cover plate designed to conceal the sprinkler
- Covers 400 sq. ft. (37,2 m^2) using less pressure than a standard ½" (12,7 mm) sprinkler at 225 sq. ft. (20,3 mm)
- Available with optional dust and air seal
- Concealed in an enclosed escutcheon plate with flat cover for use in those applications where aesthetics is a primary consideration

K FACTOR	K=11.2 (161,3)
THREAD SIZE	¾" NPT
APPROVALS	UL, C-UL, NYC
TEMPERATURE	160°F/71°C - Sprinkler 139°F/59°C - Cover Plate, 212°F/100°C - Sprinkler 165°F/74°C - Cover Plate
COVER PLATE FINISH	Chrome Plated, Brass Plated, Signal White, Grey White, Custom
SIN	TY5522
TECH DATA	TFP250



TYCO Extended Coverage Sprinklers

RFII (ROYAL FLUSH II)

Concealed Pendent

- Light hazard
- 3 mm bulb
- Maximum 20' x 20' (6,1 m x 6,1 m) QR Listing
- Concealed in an enclosed escutcheon plate with flat cover for use in those applications where aesthetics is a primary consideration
- Separable, two-piece design of the mounting cup and cover allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling
- Internally threaded closure with ½" (12,7 mm) of adjustment

K FACTOR	K=5.6 (80.6)
THREAD SIZE	½" NPT
APPROVALS	UL, C-UL, NYC
TEMPERATURE	155°F/68°C - Sprinkler 139°F/59°C - Cover Plate, 200°F/93°C - Sprinkler 165°F/74°C - Cover Plate
COVER PLATE FINISH	Chrome Plated, Brass Plated, Signal White, Grey White, Custom
SIN	TY3532
TECH DATA	TFP260



Sprinkler Wrench

TYCO Extended Coverage Sprinklers

EC-25

Upright

- All hazard
- Solder type
- Extended coverage area/density
- The maximum coverage area per sprinkler is 196 ft.^{2} (18,2 m^2), which is almost double the area offered by standard coverage sprinklers used for similar applications.
- For use in high density applications such as "big box" retailing, extra hazard, and high-piled storage occupancies
- Minimum operating pressure of 7 psi (0,48 bar)

K FACTOR	K=25.2 (362,9)
THREAD SIZE	1" NPT or ISO 7-R1
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	165°F/74°C, 214°F/101°C
SPRINKLER FINISH	Natural Brass
SIN	TY9128
TECH DATA	TFP213



Sprinkler Wrench



EC-11 & EC-14

Upright, Pendent & Recessed Pendent

- Light hazard/Ordinary hazard
- 3 mm bulb
- Designed for maximum coverage applications of 400ft^2 - 14' x 14' (4,3 m x 4,3 m) up to 20' x 20' (6,1 m x 6,1 m)
- Low profile decorative glass bulb spray sprinklers

K FACTOR	K=11.2 (161,3), K=14.0 (201,6)
THREAD SIZE	¾" NPT
APPROVALS	UL, C-UL, FM, NYC
TEMPERATURE	135°F/57°C, 155°F/68°C, 175°F/79°C, 200°F/93°C, 286°F/141°C
ESCUTCHEON	Style 30 • Style 40 Style 60
ESCUTCHEON FINISH	White Coated, Chrome Plated, Brass Plated
SPRINKLER FINISH	Natural Brass, Chrome Plated, White Polyester, Lead Coated
SIN	TY5137, TY5237, TY6137, TY6237
TECH DATA	TFP220



Sprinkler Wrenches



TYCO Extended Coverage Sprinklers

TYCO Horizontal Sidewall

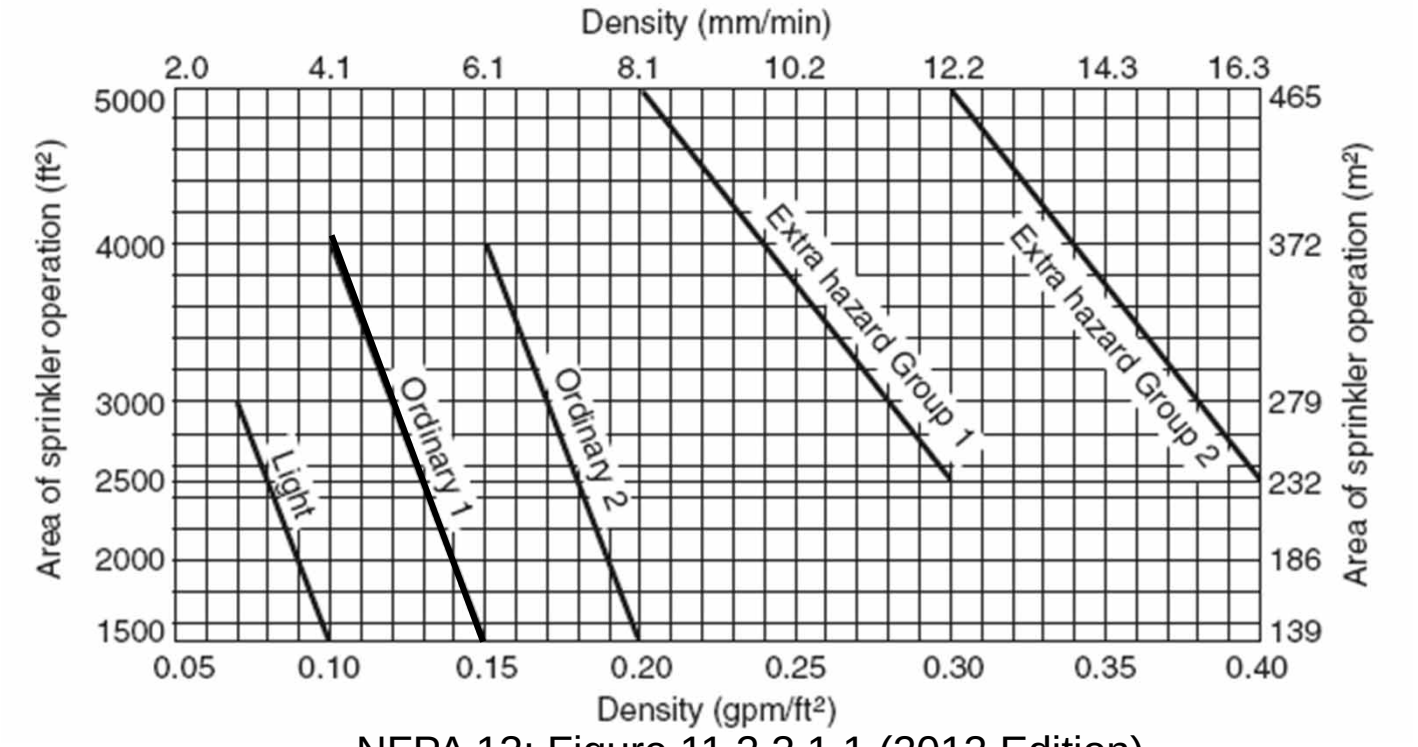
5.6 K EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLER (TY3322)

Response Rating	Coverage Area [1], Ft. x Ft. (m x m)	Minimum Flow[2], GPM (LPM)	Minimum Pressure[2], PSI (BAR)	Deflector-To-Ceiling Distance [3], In. (mm)	Sprinkler Temperature Rating, °F	Minimum Spacing [4], Ft. (m)
Quick	16 x 16 (4,9 x 4,9)	29 (110)	26.8 (1,85)	4 to 12 (100 to 300)	165	8 (2,4)
Quick	16 x 20 (4,9 x 6,1)	33 (125)	34.7 (2,39)	4 to 12 (100 to 300)	165	8 (2,4)
Quick	18 x 16 (5,5 x 4,9)	29 (110)	26.8 (1,85)	4 to 12 (100 to 300)	165	8 (2,4)

Extended Coverage Sprinklers

System Comparison with Standard Coverage

Design Criteria for this Calculation



NFPA 13: Figure 11.2.3.1.1 (2013 Edition)

Design Criteria:

Hazard Group : OH1

Density : 6.1 mm/min

Area of Operation : 139m^2

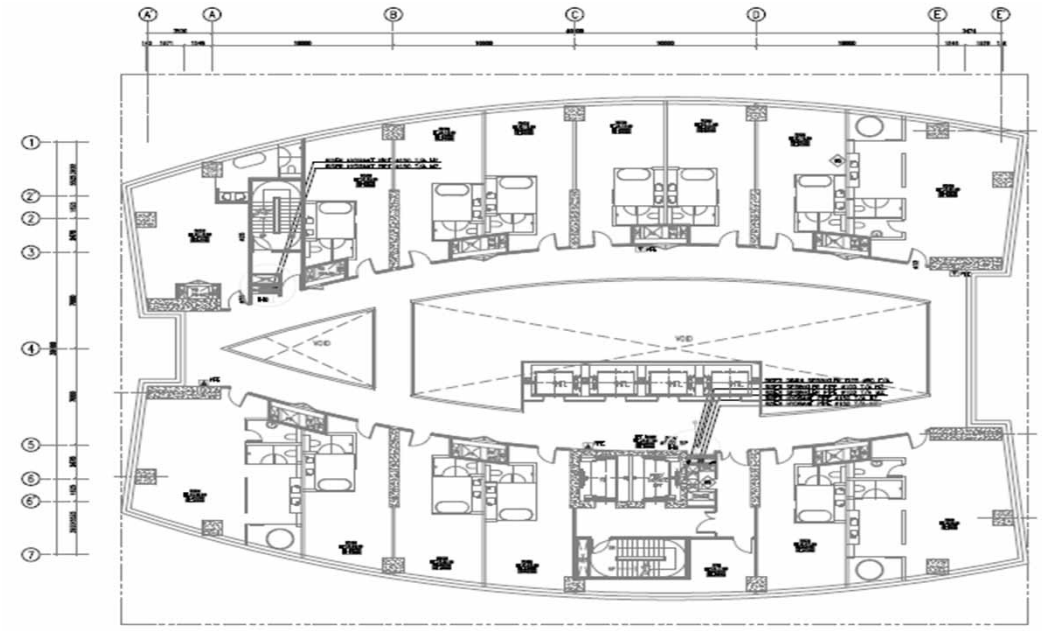
Group	K-Factor	Max. Spacing	Model
Standard Coverage	80 (5.6)	3.6m	TY-B
Extended Coverage	160 (11.2)	5.4m	SW-20

System Design for Hotel Rooms

// Example

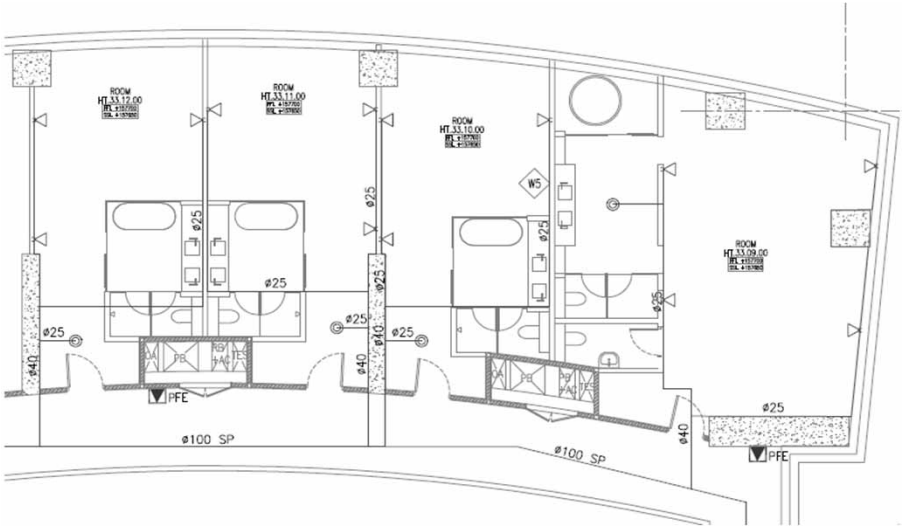
Occupancy : Hotel room
Room size : 10 rooms = 5m x 10m
: 4 rooms = 9m x 10m

Height per level : 3.5m
Number of floors : 20
Pump room : Ground floor

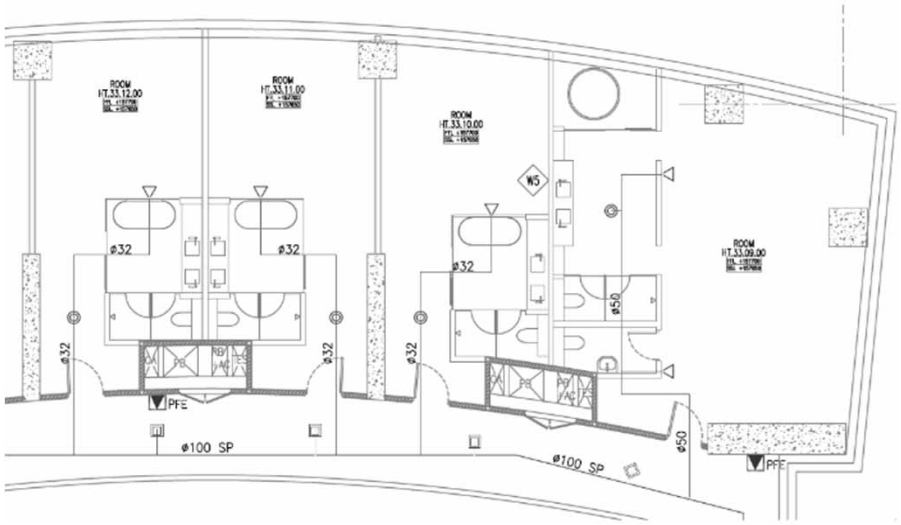


Pipe and Sprinkler Arrangement

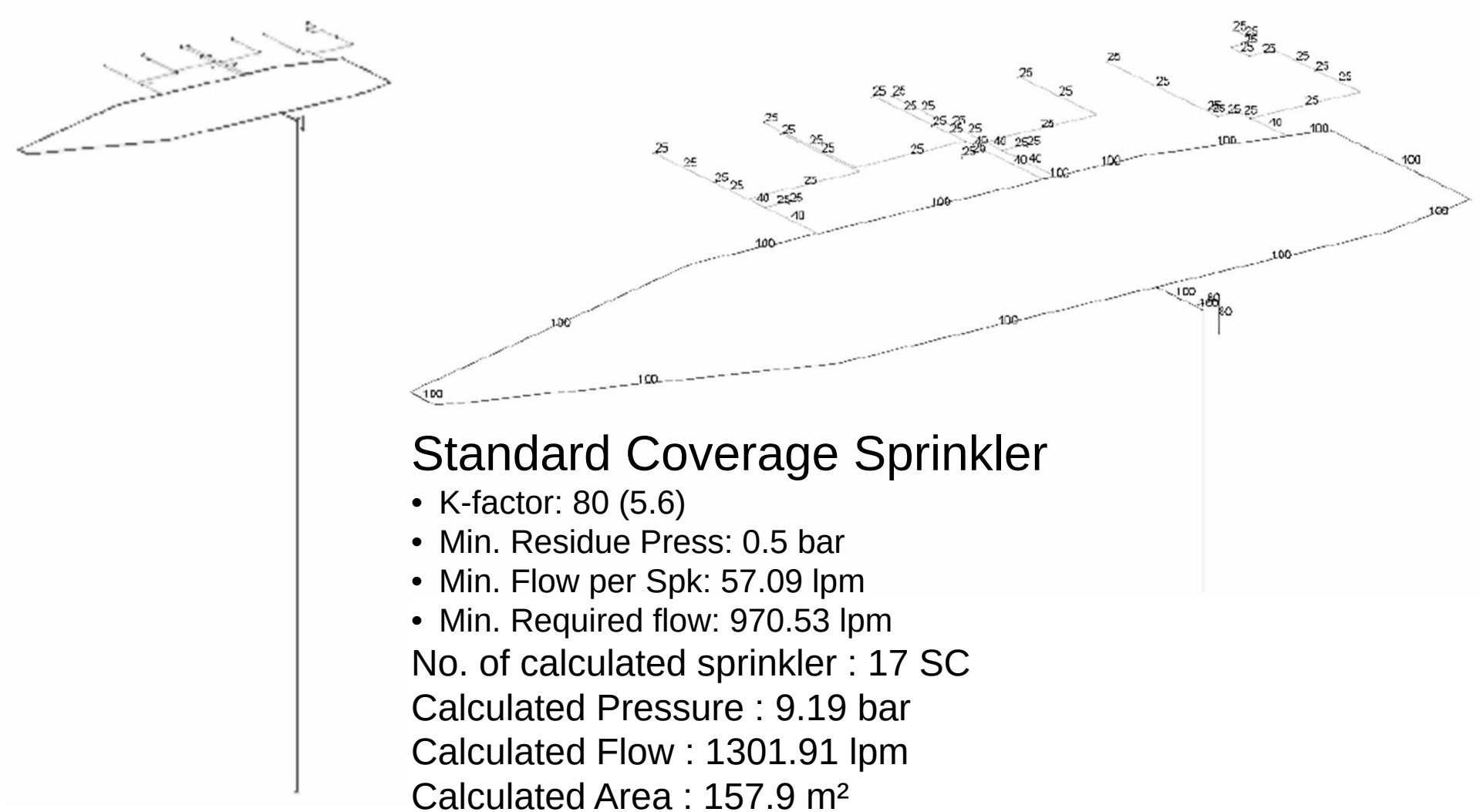
Standard Coverage Sprinkler



Extended Coverage Sprinkler



Hydraulic Calculation SC Sprinkler

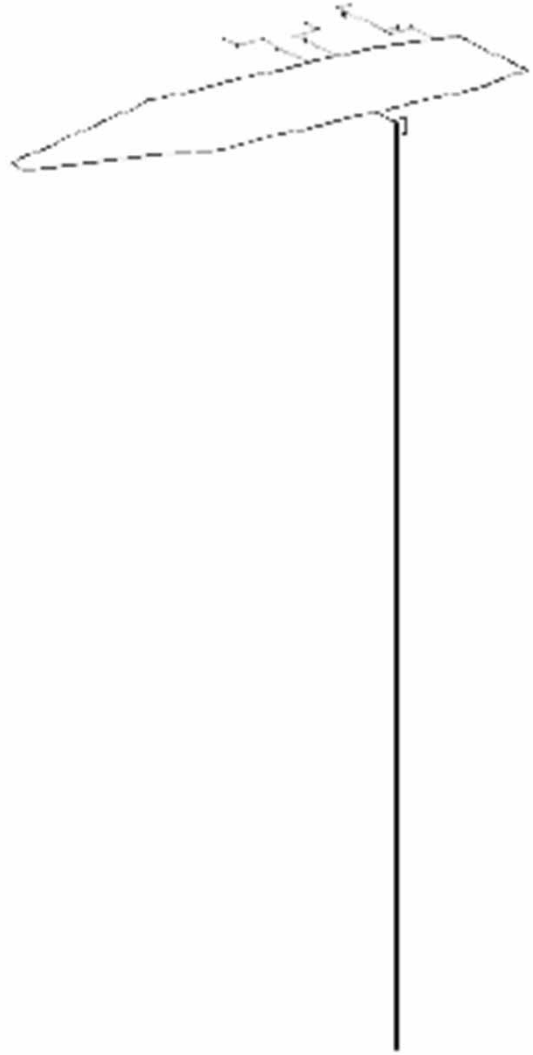


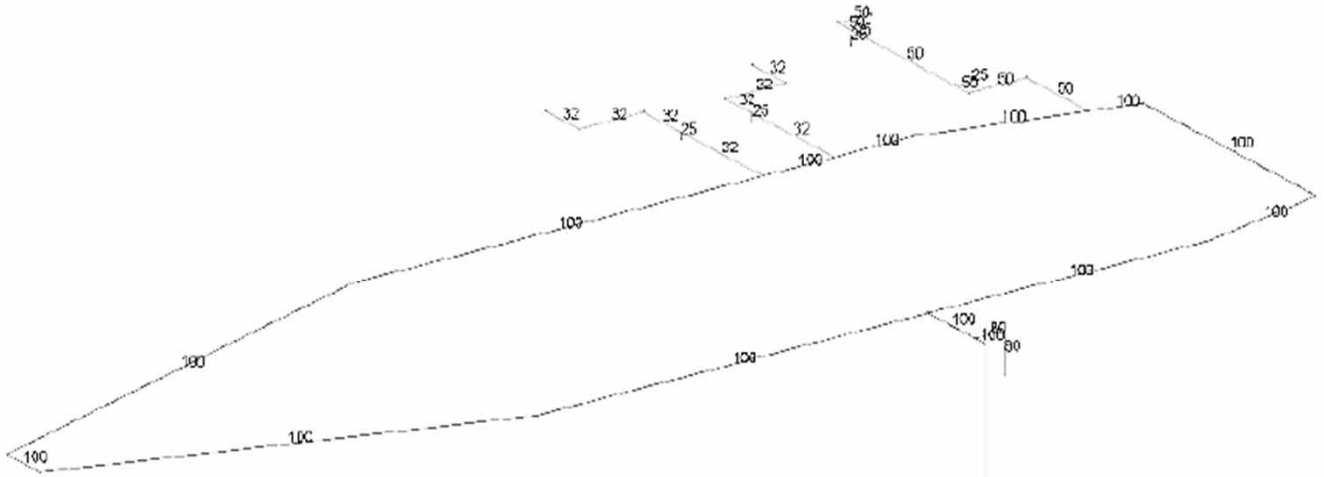
Standard Coverage Sprinkler

- K-factor: 80 (5.6)
- Min. Residue Press: 0.5 bar
- Min. Flow per Spk: 57.09 lpm
- Min. Required flow: 970.53 lpm

No. of calculated sprinkler : 17 SC
Calculated Pressure : 9.19 bar
Calculated Flow : 1301.91 lpm
Calculated Area : 157.9 m²

Hydraulic Calculation EC Sprinkler





Extended Coverage Sprinkler

- K-factor: 160 (11.2)
- Min. Residue Press: 1.46 bar
- Min. Flow per Spk: 195.2 lpm & 105.72 lpm
- Min. Required flow: 1097.96 lpm

No. of calculated sprinkler : 4 EC & 3 SC

Calculated Pressure : 9.79 bar

Calculated Flow : 1122.36 lpm

Calculated Area : 157.1 m²

Bill of Materials

Part Description	Nominal Size	Qty for SC Sprinkler	Qty for EC Sprinkler
Rigid Coupling	1" - 2"	106	78
90° Grooved Elbow	1" - 2"	38	32
Mechanical Tee - Grooved	4" x 1¼"~2"	38	14
Concentric Reducer	1¼“x1"; 1½"x1¼"	8	
Sprinkler Outlet	1"~2 x ½"~¾"	22	18
sidewall sprinkler	½" or ¾"	46	18
Pendent sprinkler	½" or ¾"	14	14
Pipe Sch40	1"	240	
	1¼"	6	96
	1½"	50	
	2"		46.4

Standard Sprinkler
- K-factor: 80 (5.6)
- Sprinkler Spacing: 3.6m

Extended Coverage Sprinkler
- K-factor: 160 (11.2)
- Sprinkler Spacing: 5.4m

COST COMPARISON

Description	SC Sprinkler			EC Sprinkler			Remark	
	QTY	Average Unit Price	Total	QTY	Average Unit Price	Total	Value different	% saving
Sprinkler	60	$ 33.05	$ 1,983.00	32	$ 99.00	$ 3,168.00	$(1,185.00)	-60%
Couplings & Fittings	212	$ 35.99	$ 7,630.00	142	$ 38.05	$ 5,403.50	$ 2,226.50	29%
Pipe meter run	296	$ 31.54	$ 9,336.64	142.4	$ 42.58	$ 6,063.89	$ 3,272.75	35%
Labour man hours	142.66	$ 15.00	$ 2,139.90	91.97	$ 15.00	$ 1,379.55	$ 760.35	36%
Total Cost per floor			$ 21,089.54			$16,014.94	$ 5,074.60	24%

Total Cost for 20 floors of SC Sprinkler = $ 421,790.80
Total Cost for 20 floors of EC Sprinkler = $ 320,298.80
Total saving for 20 floors = **$ 101,492.00**

Not inclusive: Ceiling or wall paneling, corridor, lobby, function room, and other facilities.

24% savings in system cost

Concealed Sprinklers

Concealed Sprinklers are widely used in many commercial applications as they provide that ‘clean’ look to any ceiling or wall



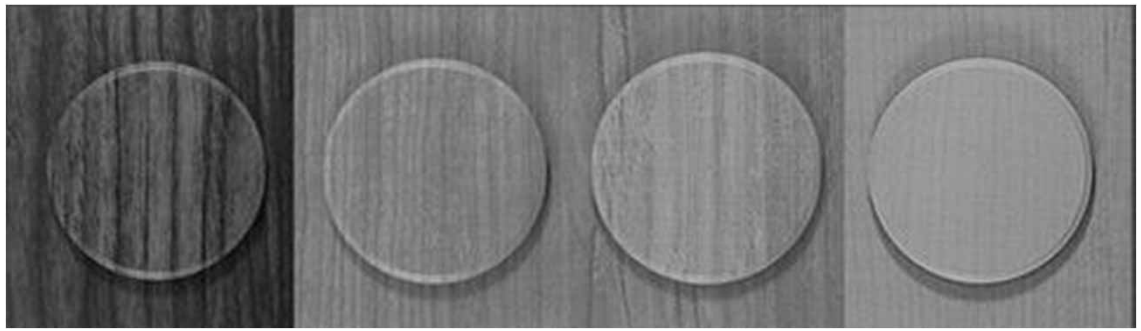
Benefits of Concealed Sprinklers

Concealed Sprinklers provide several benefits:

- ‘No Profile’ unobtrusive look
- Hidden Sprinkler
- Low risk of sprinkler damage
- Available in variety of Cover Finishes
- Factory custom painted to match surface







Inconspicuous

- Low profile unobtrusive design
- Hidden sprinkler for that clean look
- Compact small footprint



Tamper Resistant

- Impact resistant cover and hidden sprinkler parts
- No chance of hanging from or pulling sprinkler off





Extended Coverage

